

**Size:** 908 acres  
**Mission:** Store and distribute medical, textile, food, electronic, industrial, construction, chemical, and other supplies and equipment  
**HRS Score:** 37.16; placed on NPL in August 1990  
**IAG Status:** Federal Facility Agreement signed in 1991  
**Contaminants:** Chlorinated solvents, heavy metals, pesticides, petroleum/oil/lubricants, and VOCs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$63.4 million  
**Estimated Cost to Completion (Completion Year):** \$28.3 million (FY2015)  
**Final Remedy In Place or Response Complete Date:** FY2000



Tracy, California

## Restoration Background

Beginning in FY80, environmental studies identified 32 sites at this installation, including burn and disposal pits, hazardous waste storage sites, and other areas of contamination. Newly discovered sites and underground storage tanks (UST) brought the total site count to 65. Contamination has been identified in on-site soil and in on-site and off-site groundwater.

In FY86, the Remedial Investigation and Feasibility Study (RI/FS) was initiated to address the groundwater and soil contamination. The groundwater investigation was placed on a faster track because of the potential threat of contamination to the drinking water of the area.

Between FY88 and FY91, 32 USTs were removed, along with 1,060 cubic yards of contaminated soil. As of FY96, 16 sites had been closed, and 15 required Remedial Action or further characterization to achieve closure. Three former waste UST sites are being remediated via the CERCLA process because of the constituents found (e.g., trichloroethene [TCE], tetrachloro-ethene [PCE]).

A Record of Decision (ROD) for the remedy of groundwater contamination was signed in early FY93 and modified in FY95 to allow for natural attenuation of a portion of the contaminant plume outside the installation. The draft sitewide RI/FS was completed late in FY96.

In FY92, bottled drinking water was supplied to two nearby farm residences where wells were threatened by the groundwater plume. The depot also completed installation of a pump-and-treat system consisting of an air stripping plant with carbon absorption, five extraction wells, and three injection wells.

In FY95, a pilot low-flow groundwater monitoring project was completed. On the basis of the results of this project, future projects

were planned to reduce sampling costs as much as possible. An environmental geographic information system (GIS) was established, which facilitates RI/FS and Remedial Design and Remedial Action (RD/RA) work. The installation removed more than 1,000 cubic yards of contaminated soil at the child-care facility. The installationwide risk assessment was completed, and the Proposed Plan was prepared and provided to the public for comment.

In FY96, an Engineering Evaluation and Cost Analysis and an Action Memorandum for the removal of pesticide-contaminated soil from the former industrial pond and pipeline sites were completed and concurred on by the regulatory agencies. Design work for this Removal Action was initiated. The installation of extraction wells and infiltration galleries for the Operable Unit (OU) 1 groundwater air stripping pump-and-treat system also was initiated.

## FY97 Restoration Progress

The design for the Industrial Pond Soil Removal Action was completed and the implementation contract awarded. Work began on the Pesticide-Contaminated Soil Removal Action. The final sitewide RI/FS also was completed. The installation prepared the Proposed Plan for sitewide remedies, and the draft sitewide OU2 ROD was prepared and submitted.

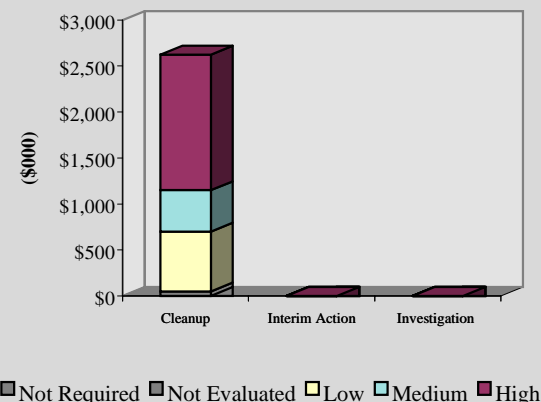
Construction continued on the OU1 extraction wells. The pump-and-treat system continued to operate. This system will be modified as part of optimization of the capture and treatment process. The contract for construction of the OU1 pump-and-treat system was awarded. Also, contaminated-soil Removal Actions were performed at five former UST sites, and approximately 376 cubic yards of contaminated soil were removed.

Closure was not achieved. Use of alternative remedial technologies such as soil bioventing and soil vapor extraction may be necessary to achieve clean closure of these sites because of economic factors and the sites' proximity to building foundations.

## Plan of Action

- Complete Soil Removal Action at former industrial and pipeline sites by the end of FY98
- Complete implementation of alternative technology for RA at remaining contaminated former UST sites; implement pilot tests in FY98
- Complete final sitewide OU2 ROD and obtain regulatory agency signatures on document
- Begin design of selected remedies for the various types of contaminated sites
- Continue operation of pump-and-treat system in FY98
- Implement low-flow sampling sitewide in FY98

## FY98 Funding by Phase and Relative Risk



**Size:** 164 acres  
**Mission:** Provide logistical support to the military services by supplying electrical and electronic material  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Low-level radioactive waste (suspected), paint, petroleum/oil/lubricants, solvents, pesticides, herbicides, PCBs, lead, hydrofluoric acid, and coal pile runoff  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$4.6 million  
**Estimated Cost to Completion (Completion Year):** \$1.1 million (FY2000)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2000



Kettering, Ohio

## Restoration Background

In July 1993, the BRAC Commission recommended closure of the Defense Electronics Supply Center (Gentile Air Force Station) and relocation of its mission to the Defense Construction Supply Center in Columbus, Ohio. An Environmental Baseline Survey (EBS) completed in FY94 identified 9 sites and 48 areas of concern (AOC) at the installation. Prominent site types include underground storage tanks (UST); areas of past industrial operations; and landfills containing construction debris, hardfill, small amounts of waste oil, solvents, asbestos, low-level radioactive waste, and a subsurface material suspected to be paint thinner. Releases from these sites have contaminated soil and groundwater.

To expedite the closure process, a reuse committee was formed in FY93. The committee includes installation personnel, state and local government officials, local business leaders, employees of the local utility company, and other local stakeholders. The primary objective of the committee is to evaluate the effect that closure of the installation will have on the community and to provide advice on the long-term future use of the installation. The committee was instrumental in preparing a market survey that evaluated types of commercial space in high demand in the area. In FY95, the findings were incorporated into an award-winning reuse plan.

The installation's BRAC cleanup team (BCT) works to identify past environmental concerns and to develop a workable plan to fully investigate the sites and AOCs. The goal of the BCT is to investigate and ensure approved cleanup of all AOCs to allow the earliest possible transfer to the Local Redevelopment Authority (LRA). The LRA has subleased two parcels on the installation. In FY96, a finding of suitability to lease was completed to further a planned conveyance by

deed of the remainder of the installation. Approximately 86 acres were leased to the LRA and the city of Kettering.

A restoration advisory board (RAB) was formed in FY94. During FY95, the RAB met quarterly to provide a forum for discussion and information. Local stakeholders showed an increased interest in the environmental program at the installation.

In FY96, the installation completed an Environmental Impact Statement, updated the installationwide EBS, and completed a Record of Decision. Remedial Design and Remedial Action activities began at the installation. In FY95, all but one of the remaining polychlorinated biphenyl (PCB) transformers were removed from the installation, and all USTs had been removed by FY97.

## FY97 Restoration Progress

The installation closed on December 1, 1996. A Memorandum of Agreement between the Defense Logistics Agency and the Air Force Conversion Agency was signed to document funding responsibilities, and the latest EBS was completed.

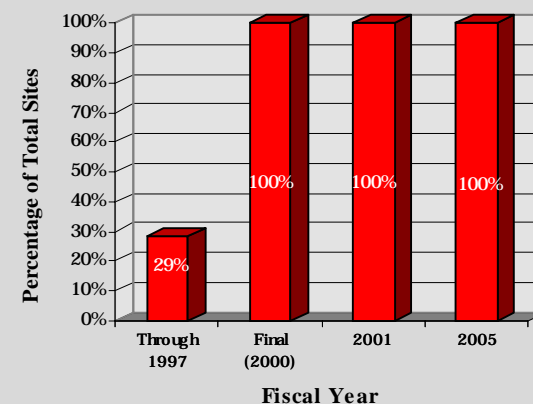
Comment resolution meetings were held to expedite document finalization, and partnering sessions and teleconferences improved working relationships with regulatory agencies. Early regulatory buy-in for Site R2 was promoted to expedite site characterization. This facilitated the prompt transfer of Parcel A to the LRA for a required tenant move-in date with a similar approach used in preparing Parcel D for transfer. In addition, the installation plans to propose and obtain regulator concurrence for CERFA-uncontaminated acreage as part of the finding of suitability to transfer preparation process for Parcels B, C, E, and F.

Some activities scheduled for completion in FY97 were delayed because EPA required validation of the draft Phase II RI data.

## Plan of Action

- Complete Phase I of the Remedial Investigation and Feasibility Study, and complete closure of the installation in FY98 under an Economic Development Conveyance
- Start long-term monitoring program in FY98
- Complete cleanup at Sites S5 and D4 in FY98
- Complete evaluation of sites M1, M7, S1, and S3 in FY98
- Complete update of BRAC Cleanup Plan in FY98
- Transfer remaining parcels of the installation by FY99

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 87 acres  
**Mission:** Procure and distribute textile, subsistence, and medical supplies in support of the Armed Forces  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Petroleum/oil/lubricants, PCBs, pesticides, and asbestos  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$11.6 million  
**Estimated Cost to Completion (Completion Year):** \$1.5 million (FY2001)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



*Philadelphia, Pennsylvania*

## Restoration Background

In July 1993, the BRAC Commission recommended closure of the Defense Personnel Support Center (DPSC) and relocation of the mission to the Aviation Supply Office in North Philadelphia, Pennsylvania. The BRAC Commission also recommended closure of two DLA activities located at DPSC: the Defense Clothing Factory and the Defense Contract Management District Mid-Atlantic.

Environmental studies since FY82 identified the following site types: underground storage tanks (UST), aboveground storage tanks, pesticide management areas, hazardous waste management areas, polychlorinated biphenyl (PCB)-containing transformers, asbestos-contaminated areas, and former railroad track areas. A plume, identified as primarily JP-4 jet fuel underlies large portions of the installation. Studies conducted to date indicate that the plume originated off site and migrated onto DPSC.

The installation completed the cleanup of a PCB-contaminated sewer site, preliminary analysis of soil and groundwater, and a draft work plan for Remedial Investigation and Feasibility Study (RI/FS) activities. RI/FS and Remedial Action (RA) activities began at the clothing factory in FY94 in preparation for interim leasing to the city of Philadelphia. RA activities included the cleanup of DDT in two buildings and the removal of two USTs associated with use of DDT.

A hazardous waste management area was closed, and asbestos remediation was completed in one of the buildings of the clothing factory. RI activities to determine the extent and source of the petroleum contamination underlying the installation are now complete.

The BRAC cleanup team (BCT), formed in FY94, has provided information to the Base Transition Office and the Local Redevelop-

ment Authority to support reuse plans for the installation. The final Environmental Baseline Survey and the BRAC Cleanup Plan (BCP) are complete, and an Environmental Assessment was prepared to evaluate alternatives for the reuse of the clothing factory. The BCP is updated annually. In FY95, a restoration advisory board was established.

During FY95–FY96, RAs were completed at all known UST sites and three USTs were closed. All PCB-containing transformers were removed. Remediation of asbestos contamination at several buildings continued, and Phase I of the basewide Expanded Site Inspection (ESI), previously known as the RI/FS, was completed. Baildown and recovery tests were completed for 12 on-site wells where a petroleum groundwater plume is present, and removal of free product from the surface of the groundwater began. A consent decree was signed between the installation, the Pennsylvania Department of Environmental Protection (PaDEP), and Sun Oil allowing the parties to collaborate on defining the extent of the plume and to develop a remediation plan to recover free product.

## FY97 Restoration Progress

The finding of suitability to lease for Building 13, portions of Building 9, and an adjacent parking area was completed in April 1997. The lease for these parcels was signed in May 1997.

A conceptual plan and a risk assessment plan for the installation were completed in May 1997 and approved by PaDEP on July 29, 1997. The risk assessment study will be completed in January 1998. Phase II of the ESI has been completed.

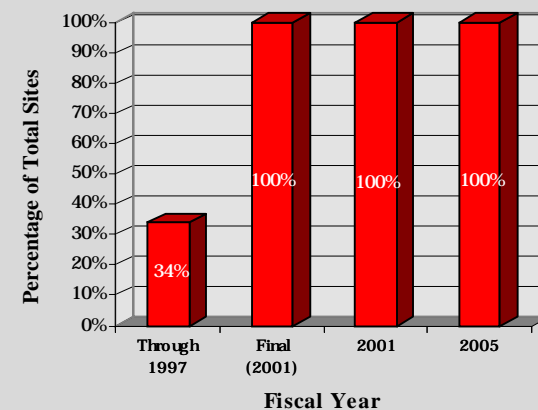
Approximately 15 percent of the parcels at the installation have been certified as environmentally clean.

Nineteen FFCA Sites are identified, of which two have been remediated and certified closed by the BCT. Twenty-four of the original 44 Installation Restoration Program (IRP) sites were in various stages of investigation or remediation in FY97.

## Plan of Action

- Phase III of the ESI will be completed in FY98
- Continue Remedial Action and/or closure of the IRP sites will continue in FY98
- The Human Health Risk Assessment will be completed in FY98
- Begin Phase I of the plume remediation in FY98
- Complete closure of the installation in FY99

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 631 acres  
**Mission:** Manage general supplies for the Armed Services  
**HRS Score:** 33.85; placed on NPL in July 1987  
**IAG Status:** IAG signed in 1991  
**Contaminants:** Phenols, solvents, paints and paint residues, corrosives, pesticides, refrigerants, antifreeze, photographic chemicals, and oils  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$25.5 million  
**Estimated Cost to Completion (Completion Year):** \$32.6 million (FY2015)  
**Final Remedy In Place or Response Complete Date:** FY2001



Richmond, Virginia

## Restoration Background

Preliminary Assessment and Site Inspection activities identified 31 sites at this installation. During negotiation of an FY91 Interagency Agreement, sites were grouped into eight operable units (OU) and six Expanded Site Inspections (ESI). In FY92, a ninth OU was listed as an Interim Action site. Seven of the sites were determined to pose no hazard to the environment; four sites are not covered by CERCLA.

In FY89, an underground storage tank (UST) program was implemented. Through FY95, 30 tanks were replaced with double-wall plastic tanks and the need for 20 tanks was eliminated.

Two Records of Decision (ROD) were signed in FY92, designating institutional controls for contaminated soil at OU1 and a vapor vacuum extraction system as the Remedial Action (RA) for contaminated soil at OU5. Operations at a pilot plant indicated that contamination in the OU5 soil had decreased to nondetectable levels, prompting modification of the ROD and OU5 closeout.

In FY93, a third ROD was signed, requiring installation of an extraction and treatment system to remove volatile organic compounds (VOC) from the groundwater at OU9. The system was implemented in September 1996.

In FY95, a fourth ROD requiring a two-phase RA for soil at the National Guard Area was signed. Institutional controls and excavation and disposal of 150 cubic yards of contaminated soil have been implemented.

Six ESIs were completed in FY95. Three of the areas proceeded to the Remedial Investigation and Feasibility Study (RI/FS) phase and were designated OU10, OU11, and OU12. One area was combined with OU4, and the remaining two require no additional action. During the RI/FS for OU7, another site was identified, which was called OU13.

In FY95, exploratory trenching of soil at OU2 was conducted to characterize the materials that had been disposed of in an abandoned landfill.

During FY96, the installation completed investigations at one UST site, closed out the investigation of an indoor pistol range, and implemented an air stripping system. The RIs for the fire training area (OU4 and OU7), the acid neutralization pits (OU8), and the fire training pit (OU7) were completed. Fieldwork also was completed for a pilot study for OU7 and OU8 to determine the feasibility of a dual-phase vacuum vapor extraction technology and for the background risk assessment. A computer model of the contamination plume for the PX Gas Station was completed, and the corrective action plan was modified.

## FY97 Restoration Progress

The installation implemented a recovery system for the gasoline phase on groundwater at the PX Gas Station. The installation completed remediation of soil at OU3 and finished the draft RIs for OU10, OU11, OU12, and OU13. The installation also completed the background risk assessment, the draft FS for OU2, and the final FS for OU4. A work plan for removal of contaminated soil from OU2 and a draft Proposed Plan for OU4 were completed.

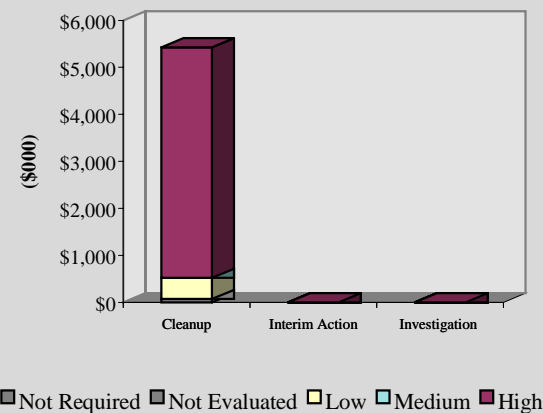
The installation initiated a Treatability Study for groundwater at OU8 and continued groundwater monitoring at the PX Gas Station to update the computer model.

Some activities scheduled for completion in FY97 were delayed because comments from EPA required additional studies for several sites.

## Plan of Action

- Perform oil Removal Action for soil at OU2 in FY98
- Complete FS and Proposed Plan for OU2 in FY98
- Complete Proposed Plan, issue ROD, and start Remedial Design (RD) for soil at OU4 in FY98
- Determine point of compliance, complete FS, draft Proposed Plan, and draft ROD for OU6 in FY98
- Conduct pilot test for density-driven convection technology at OU7 in FY98
- Complete FS, finalize Proposed Plan, and submit draft ROD at OU7 in FY98
- Complete Treatability Study and FS for OU8 and submit draft Proposed Plan and ROD in FY98
- Issue RODs for OU10 and OU11 in FY98
- Complete FS for OU12 and OU13 in FY98.
- Submit draft Proposed Plan and draft ROD for OU13 in FY98

## FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 342 acres  
**Mission:** Develop, field, and sustain combat and tactical vehicles  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Heavy metals, VOCs, SVOCs, and PCBs  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$3.5 million  
**Estimated Cost to Completion (Completion Year):** \$8.6 million (FY2001)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY2001



## Detroit, Michigan

### Restoration Background

In July 1995, the BRAC Commission recommended the realignment of Detroit Arsenal and the closing and disposing of the Detroit Arsenal Tank Plant. The installation is scheduled to close in September 1998.

Environmental studies conducted at the installation identified the following site types: underground storage tanks (UST), landfills, metal plating and surface treatment areas, and petroleum release areas. Studies have determined that groundwater and soil are contaminated with volatile organic compounds (VOC) and heavy metals.

Completed Interim Actions include removal of USTs, excavation of contaminated soil, and in-situ treatment of petroleum-contaminated soil. Cleanup activities also were completed at a fuel farm site and a metal plating area.

In FY95, the installation formed a BRAC cleanup team (BCT), and the Local Redevelopment Authority (LRA) began work on the land reuse plan.

In FY96, the commander established a restoration advisory board (RAB) that elected members and held meetings to promote exchange of information between the community and regulatory agencies. The installation completed an Environmental Baseline Survey (EBS) and a CERFA report. Based on the results of the EBS, the installation initiated a contract for a Remedial Investigation and Feasibility Study (RI/FS) and held a kickoff meeting for evaluating radiological hazards.

### FY97 Restoration Progress

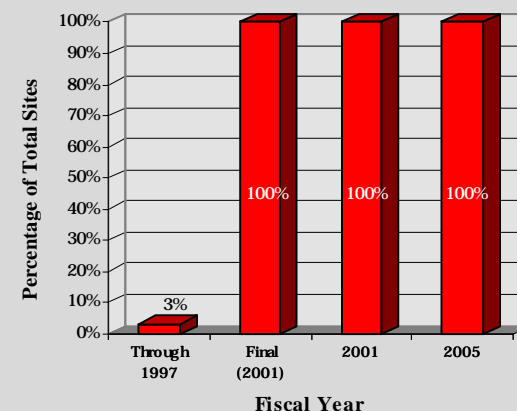
The regulatory agencies approved RI work plans. The installation subsequently completed the RI Phase I fieldwork and presented the results in the RI Phase I Report. The report is now under review. The LRA completed the land reuse plan, which consists of a mixture of commercial and industrial reuse. A finding of suitability to transfer (FOST) was initiated to transfer CERFA-clean acreage for immediate reuse.

The installation completed the Version I BRAC Cleanup Plan. The Army entered into a Defense and State Memorandum of Agreement (DSMOA) Cooperative Agreement with the state of Michigan to shorten document turnaround time. Subject matter experts addressed RAB meetings to educate RAB members on the RI and cleanup process.

### Plan of Action

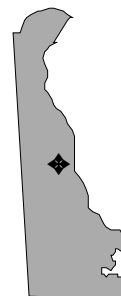
- Complete the RI/FS in FY98
- Transfer CERFA-clean acreage in FY98
- In FY98, transfer all sites recommended for no further action on the basis of the Phase I sampling results
- Complete Relative Risk Site Evaluation at remaining 25 sites in FY98
- In FY99, transfer all sites recommended for no further action on the basis of the Phase II sampling results
- Initiate Remedial Action for Buildings T-12 and T-18, and Area 521, in FY99
- Complete all BRAC activities by the end of FY01

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR





**Size:** 3,730 acres  
**Mission:** Provide airlift support for troops, cargo, and equipment  
**HRS Score:** 35.89; placed on NPL in March 1989  
**IAG Status:** Federal Facility Agreement signed in August 1989  
**Contaminants:** Solvents, paints, petroleum products, VOCs, heavy metals, and plating wastes  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$33.7 million  
**Estimated Cost to Completion (Completion Year):** \$58.2 million (FY2011)  
**Final Remedy in Place or Response Complete Date:** FY2004



## Dover, Delaware

### Restoration Background

Since 1942, this base has provided airlift assistance for troops, cargo, and equipment. Waste management practices at the installation have contaminated the shallow groundwater aquifer with petroleum products, volatile organic compounds (VOC), and heavy metals. The principal site types at the installation are underground storage tanks (UST), oil-water separators, fire training areas, landfills, fuel spills and leaks, and a fuel hydrant system.

Environmental studies have identified 59 sites since FY83. These sites include petroleum and VOC contamination. Sources of petroleum contamination include the fuel hydrant system and tank farm sites; sources of VOC contamination include aircraft cleaning and maintenance operations.

In FY86, the installation conducted soil removal at the old industrial waste basins. In FY92, contaminated soil was removed from a fire training area. Remedial Investigation and Feasibility Study (RI/FS) fieldwork was completed in FY94. A focused Feasibility Study (FFS), undertaken in FY94, addressed three source areas: VOC-contaminated soil, affecting groundwater; sediment in a drainage ditch contaminated with heavy metals; and a solvent plume in the shallow groundwater aquifer.

In FY95, the installation began pilot tests of innovative treatment technologies. Three RODs were signed, which incorporated the innovative treatment technologies into Remedial Actions (RA). The installation completed the RA at the former waste oil tank site, removed USTs from one site, and began recovery of free product at two sites contaminated with JP-4 jet fuel. In addition, one FFS was completed for groundwater contaminated with chlorinated solvents.

An installationwide FS planned for mid-FY96 was postponed because of problems associated with ecological risk.

The installation implemented natural attenuation at one of the four sites contaminated with chlorinated solvents. Information about the three remaining sites is not yet sufficient to begin remediation.

The installation characterized the area of soil in the industrial area that is contaminated with pesticides. Corrective action plans (CAP) were completed for seven sites contaminated with petroleum products: three sites were slated for natural attenuation; one site is undergoing excavation; bioslurping is being implemented at two sites; and vacuum-enhanced product slurping (VEPS) is in use at one site.

### FY97 Restoration Progress

Installationwide RIs were approved by state and federal regulators. Subsequent FSs were delayed because of EPA concerns about ecological risk. Potential solutions are being evaluated by EPA's Biological Technical Assistance Group, and the concerns are expected to be resolved by mid-calendar-year 1998. The installation continued natural attenuation at one of the four sites contaminated with chlorinated solvents. Remediation Technology Development Forum technical evaluations of natural attenuation, bioremediation, and co-metabolic bioventing continued at the three remaining chlorinated solvent sites. Three Records of Decision (RODs) were signed for four additional sites in FY97. A Remedial Design characterization of a former fire training area was conducted by magnetic scanning and ground-penetrating radar. In addition, the National Test Site conducted field experiments in cooperation with the Dover Air Force Base Restoration Program using six-phase

resistive heating, geoprobe, cone penetrometer, and on-site laboratory analysis.

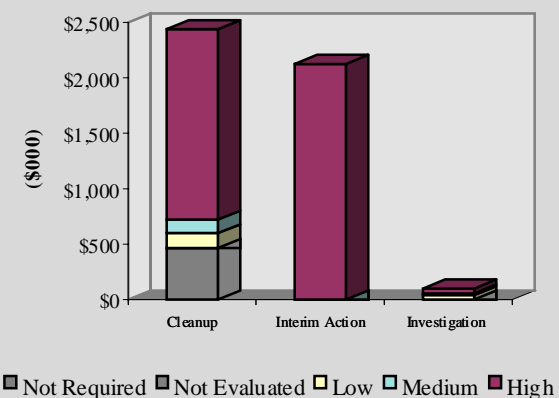
The installation characterized a source of pesticide soil contamination in the industrial area and completed Engineering Evaluation and Cost Analysis of soil removal with an asphalt cap. CAPs were completed and approved for six petroleum-contaminated sites. Natural attenuation is the remedy for three of these sites, and free-product recovery by skimming will be implemented at the other three sites. An ongoing excavation of contaminated soil at the site of a former landfill on the golf course will be completed by early 1998.

Some activities scheduled for completion in FY97 were delayed because differing site conditions prevented free-product recovery pilot tests and the soil excavation project, and approval of a no-further-remedial-action-planned ROD for approximately 20 sites is on hold pending resolution of ecological issues.

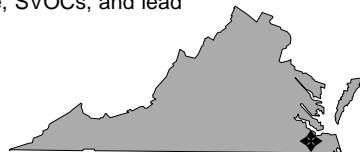
### Plan of Action

- Complete construction of free-product recovery skimming project in FY98
- Complete soil excavation project on the golf course in FY98
- Complete pesticide source excavation and asphalt cap project in FY98
- Complete FSs for active sites in FY98
- Generate ROD to close out approximately 20 sites in FY98
- Complete design and investigation of a former fire training area in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 597 acres  
**Mission:** Provided radio transmitting facilities and services to support Naval ships, submarines, and aircraft  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Dichlorobenzene, PCBs, petroleum/oil/lubricants, trichlorobenzene, SVOCs, and lead  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$6.8 million  
**Estimated Cost to Completion (Completion Year):** \$0 (FY 2001)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1996



*Suffolk, Virginia*

## Restoration Background

This facility was established as a Naval Air Station to train pilots during World War II. The installation was converted to a transmitter facility after the war. In July 1993, the BRAC Commission recommended closure of the installation. Installation operations ceased on March 31, 1994.

Since FY84, environmental studies have identified 11 sites at the installation. Site types include a former service station, two polychlorinated biphenyl (PCB) spill areas, and a number of landfills and other areas used to dispose of solvents, acids, bases, and general refuse.

In FY87, a confirmation study was completed for Sites 1, 5, and 8. At Site 1, a former landfill, semivolatile organic compounds (SVOC) were detected in groundwater. In FY93, the installation completed a Removal Action to remove PCB-contaminated soil at Site 5. In FY94, a Remedial Investigation and Feasibility Study (RI/FS) was completed and a Record of Decision (ROD) was signed for Site 5. In addition, cleanup was completed at Site 8, a former gas station, where soil was contaminated with petroleum hydrocarbons and lead.

During FY95, the installation completed a Site Inspection (SI) for Sites 2, 3, 4, 6, 9, 10, and 11; no further action was recommended for the sites. The installation also completed the RI/FS at Site 1 and initiated long-term monitoring (LTM) at the site. The Remedial Design and Remedial Action (RD/RA) were completed for Site 5. Cleanup consisted of removing and disposing of 2,200 cubic yards of PCB-contaminated soil. The installation also constructed a soil cap for creosote-contaminated soil at Site 7. A Removal Action for Site 8, which consisted of excavation and off-site thermal incineration of contaminated soil, also was completed. The installation removed PCB-contaminated soil from the storage area near Building D-10.

An Environmental Baseline Survey (EBS) was completed in FY94. The EBS identified 557 acres as uncontaminated. The installation was divided into five parcels to facilitate transfer of property. In FY92, the installation completed baseline Ecological and Human Health Risk Assessments for Site 5.

The installation formed a technical review committee in FY88 and converted it to a restoration advisory board (RAB) in FY94. The RAB holds quarterly meetings. Its members represent the Navy, the Virginia Department of Environmental Quality, EPA Region 3, and the local community. In FY92, the installation completed a community relations plan and an Administrative Record, and established an information repository at the Morgan Memorial Library.

A BRAC cleanup team (BCT), formed in FY94, includes representatives of the state, EPA Region 3, and the Navy. The BCT prepared a BRAC Cleanup Plan (BCP) in FY94. The BCT's monthly meetings have reduced project schedules and costs because the BCT can address issues, concerns, and regulatory comments in advance of any action.

During FY96, the installation completed a Preliminary Assessment, an SI, and an RA for Site 7 and completed an RA for Building D-10. Hydraulic and ecological LTM began at Sites 1, 5, and 7. The installation also completed its land reuse plan.

As the focus of a FY96 fast-track initiative, the installation used field screening techniques at two sites. These techniques fostered well-informed selection of sampling points, improved the efficiency of field investigations, and produced high-quality site characterization data.

## FY97 Restoration Progress

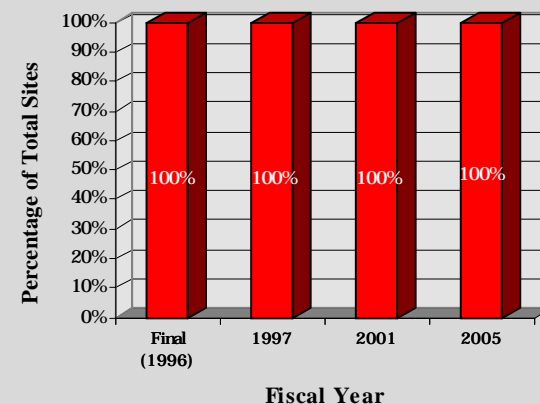
The installation completed the final versions of the BCP and made addendums to the original EBS. The Site 1 ROD also was completed and signed, and LTM continued at Sites 1, 5, and 7. The RAB was discontinued.

Some activities scheduled for completion in FY97 were delayed because the Land Reuse Plan may need to be modified.

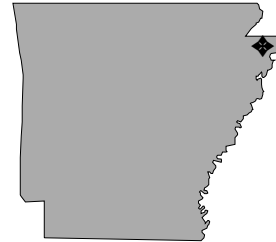
## Plan of Action

- Prepare a finding of suitability to transfer for the property in FY98
- Update the land reuse plan and the EBS in FY98

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 3,286 acres  
**Mission:** Supported B-52 strategic bombers and KC-97 and 135 stratotanker operations  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Petroleum hydrocarbons, VOCs, and metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$25.2 million  
**Estimated Cost to Completion (Completion Year):** \$4.8 (FY2003)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1999



## Blytheville, Arkansas

### Restoration Background

In July 1991, the BRAC Commission recommended closure of Eaker Air Force Base, which formerly supported aircraft and tanker operations. The installation was closed on December 15, 1992.

Prominent site types at the installation include underground storage tanks (UST), aboveground storage tanks, oil-water separators, petroleum/oil/lubricant (POL) spill sites, and landfills. Other sites identified during previous investigations include a fire training area, storage areas, an explosive ordnance disposal (EOD) range, a small arms firing range, a trap and skeet range, a JP-4 jet fuel hydrant system, and a bulk fuel storage tank farm. Petroleum hydrocarbons, volatile organic compounds (VOC), and metals have been released into groundwater and soil from those sites. Environmental studies conducted between FY85 and FY90 identified 12 sites. In FY90, a RCRA Facility Assessment identified 21 solid waste management units and 9 areas of concern.

Remedial Investigation and Feasibility Study fieldwork was initiated for the first 12 sites. Later, an Administrative Consent Order was signed that indicated that 30 sites (including the initial 12 sites) are subject to RCRA corrective action and will be addressed under a RCRA Facility Investigation (RFI). The installation also completed an Environmental Baseline Survey and identified 337 acres as CERFA-clean.

Interim Actions completed at the installation include removal of 125 USTs and 31 oil-water separators, abandonment in place of the JP-4 fuel hydrant system, remediation of contaminated soil at the UST sites and at the JP-4 fuel hydrant system by a soil treatment technology, and provision of an interim soil cover and native vegetation for Landfill 4. Several innovative technologies were demonstrated under the installation's restoration program. The installation also is using

natural attenuation and land treatment to remediate contaminated soil. In FY95, fieldwork began for the RFI.

In FY96, the installation submitted an RFI Report to the regulatory agencies. Human Health and Ecological Risk Assessments were performed at contaminated sites. Remediation by bioslurping was implemented at the installation service station, and bioventing was initiated at three sites. The installation completed clearance of unexploded ordnance at the EOD range and is completing a report presenting the results of sampling conducted there. The installation also completed sampling at the Defense Reutilization and Marketing Office (DRMO) storage facility under an approved closure plan.

The installation formed a BRAC cleanup team and a restoration advisory board in FY94. The installation completed a community relations plan in FY95.

### FY97 Restoration Progress

Several Interim Removal Actions occurred: removal of pesticide-contaminated soil, removal of one UST, and removal of free product by bioslurper at the base service station. Several wells at various SWMUs also were bailed periodically to remove product. In addition, the installation continued to use innovative technology such as bioslurping and geoprobe. Cleanup activities continued at POL spill sites. The installation also evaluated parcels of land for possible lease or transfer. The installation is awaiting concurrence from regulatory agencies on the determination of 337 acres as CERFA-clean.

The initiation of on-site instead of off-site treatment of wastewater from remedial activities improved site management in FY97. Use of a model site during the planning stage of the corrective measures study (CMS) to demonstrate the CMS process and variables helped resolve issues with the state and EPA. The latest version of the BRAC

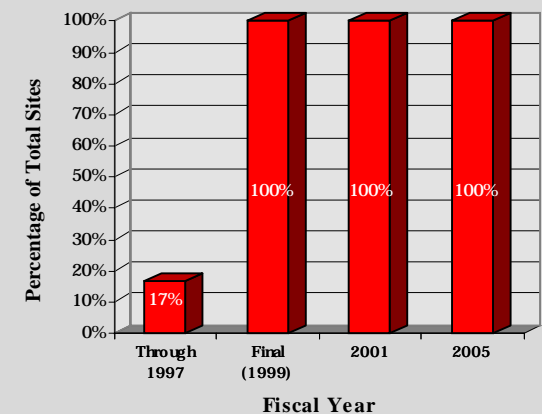
Cleanup Plan and several Supplemental Environmental Baseline Surveys also were prepared.

An unanticipated lag in providing regulators with responses to comments on closure documents delayed completion of some activities scheduled for FY97.

### Plan of Action

- Receive approval on RFI Report and conduct CMS and Interim Remedial Actions in FY98
- Complete closure of the EOD range in FY98
- Close the DRMO storage facility in FY98
- Implement and have in place all Remedial Actions by FY99

### SITES ACHIEVING RIP OR RC PER FISCAL YEAR





**Size:** 706 acres shoreline; 10,428 acres inland  
**Mission:** Handle, store, renovate, and ship munitions  
**HRS Score:** 37.21; placed on NPL in August 1990  
**IAG Status:** Federal Facility Agreement signed in December 1990  
**Contaminants:** VOCs, SVOCs, heavy metals, hydrocarbons, and petroleum products  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$13.0 million  
**Estimated Cost to Completion (Completion Year):** \$21.5 million (FY2030)  
**Final Remedy in Place or Response Complete Date:** FY2004



Colts Neck, New Jersey

## Restoration Background

Preliminary Assessments completed in FY83 identified 29 sites of concern, 4 of which required further investigation. The sites include landfills, production areas, storage areas, maintenance areas, and disposal areas. To date, 65 sites (46 CERCLA and 19 underground storage tank [UST]) have been identified. Releases of volatile organic compounds (VOC) and heavy metals from landfills and production areas have contaminated groundwater and soil at the installation.

In FY87, a Site Inspection (SI) identified 11 contaminated sites. An SI in 1992 examined 16 additional sites. The first SI recommended additional characterization of the 11 identified sites through well monitoring, soil borings, and surface water sampling. No further action was recommended for two sites. The second SI recommended further action at 13 sites and established the need for basewide background data for decision-making.

In FY91, the installation began Remedial Investigation and Feasibility Study (RI/FS) activities. An interim draft RI report for the first 11 sites was submitted in FY92. The report recommended cleanup of all sites, including capping, removal, and long-term monitoring (LTM). The first round of RI/FS was completed in late FY93. Background and watershed data were obtained during the second RI/FS round in FY94.

The installation completed Removal Actions for several UST sites in FY93. One UST site was investigated in FY91 and closed in FY92. Spills and overfills at two UST sites had contaminated surrounding soil, which was excavated and disposed of in FY93.

In FY94, the installation completed a work plan, an Action Memorandum, and an Engineering Evaluation and Cost Analysis for a Removal Action at Site 20. The installation also began preparing a corrective

action plan for UST 8. USTs that had been used to store heating oil were removed, and a number of leaking USTs were identified.

In FY95, the installation completed RI fieldwork at 21 sites. EPA approved recommendations for no further action at 14 sites. A Removal Action was completed at Site 20. The removed soil was taken to an asphalt plant for recycling. No further action was recommended for six UST sites.

In FY90, the installation formed a technical review committee (TRC), completed a community relations plan (CRP), and established an information repository containing a copy of the administrative record. In FY95, the TRC was converted to a restoration advisory board (RAB). A public meeting was held with the Monmouth County Health Department to discuss the cleanup program at the installation and the formation of the RAB. The RAB also held its first formal meeting, and 20 RAB members participated in a site visit.

Coordination and cooperation between the Navy, EPA Region 2, the New Jersey Department of Environmental Protection (NJDEP), and officials of Monmouth County are good. Under a partnership initiated in FY95 with the Monmouth County Health Department, geographic information system (GIS) maps of the installation were developed to support decision-making and promote public involvement.

In FY96, the installation signed a data-sharing agreement with NJDEP. This agreement enabled the Navy to overlay state wetland delineations and aerial photographs onto GIS maps. The installation completed the RI for 27 sites, initiated Removal Actions at 5 sites, and began FS activities at 4 sites. A pilot study begun in FY96 helped the installation determine the best method of removing a layer of free product from groundwater at Site 16.

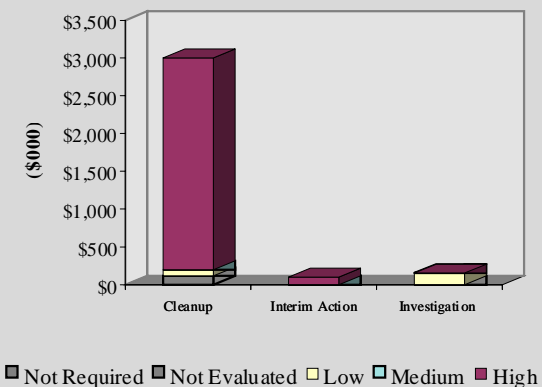
## FY97 Restoration Progress

The installation completed Remedial Actions (RA) at five sites and the FS at four sites. Remedial Design (RD) began for two landfill caps, surface soil remediation, and four UST sites. The installation began using accelerated fieldwork techniques such as laser-induced fluorescence, geoprobe, and cone penetrometer. The combination of these techniques and use of an on-site mobile laboratory expedited site characterization.

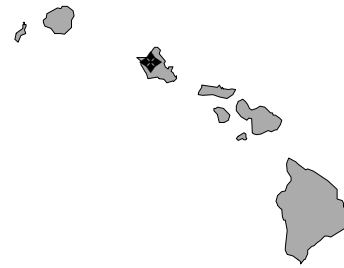
## Plan of Action

- Update the CRP in FY98
- Complete the RD for three sites in FY98
- Install landfill caps and perform soil removal in FY98
- Begin corrective actions for four UST sites and RA at four other sites in FY98
- Begin RD for Site 26 in FY98

## FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 2,400 acres  
**Mission:** Operate and maintain communications facilities and equipment for Naval shore installations and fleet units in the eastern Pacific  
**HRS Score:** 50.00; placed on NPL in May 1994  
**IAG Status:** Draft Federal Facility Agreement  
**Contaminants:** PCBs, metals, and petroleum hydrocarbons  
**Media Affected:** Soil  
**Funding to Date:** \$5.9 million  
**Estimated Cost to Completion (Completion Year):** \$45.3 million (FY2030)  
**Final Remedy in Place or Response Complete Date:** FY2014



*Wahiawa, Hawaii*

## Restoration Background

This installation operates six facilities on the island of Oahu but conducts industrial operations primarily at the main station and receiver site in Wahiawa and the Naval Radio Transmitting Facility in Lualualei. The restoration program has focused on those two facilities, where maintenance and operation of electrical transformers and switches have been the primary sources of contamination. The installation was placed on the National Priorities List (NPL) because polychlorinated biphenyl (PCB)-contaminated soil was detected in work and residential areas. Contamination with metals and petroleum hydrocarbons also resulted from the station's operation and maintenance activities.

Environmental investigations began at the installation in FY86. A total of 24 CERCLA sites and 4 underground storage tank (UST) sites have been identified to date. Site Inspections (SI) have been conducted for Sites 1, 5, 11, and 14 through 19. Expanded Site Inspections (ESI) were conducted for Sites 1, 5, and 11.

In FY92, the installation conducted a Removal Action at Site 14 to remove PCB-contaminated soil in the vicinity of eight transformers. The results of a risk assessment prepared after the Removal Action indicated that no further action was required. The ESI identified elevated levels of lead and mercury at the Old Wahiawa Landfill and the Building 6 Disposal Area.

In FY95, the installation completed planning documents for the Remedial Investigation and Feasibility Study (RI/FS) at Sites 1, 5, 6, 10, 12, 13, 17, 18, and 20. RI/FS activities include screening risk assessments to determine whether further action is required. This approach is intended to accelerate the cleanup process at the installation.

Because the installation consists of two primary facilities, two restoration advisory boards (RAB) were established. Both the Wahiawa and the Waianae/Lualualei RABs have approximately 25 members representing the community. Both meet quarterly. Members of the community have been instrumental in the discovery of sites, as well as in locating numerous wells in the vicinity of the installation. The final community relations plan was completed in FY95.

In FY95, the Navy completed a draft Federal Facility Agreement (FFA) with EPA. The Navy acknowledged the receipt of the draft FFA and its willingness to begin negotiations on the agreement. Since then, however, the Navy has given the FFA low priority because the cleanup program has been progressing at the installation.

In FY96, the Navy conducted RI/FS activities at Sites 1 and 5 and determined that no further action was required at UST Site 6. In the same year, initial site characterization was conducted at UST Site 8.

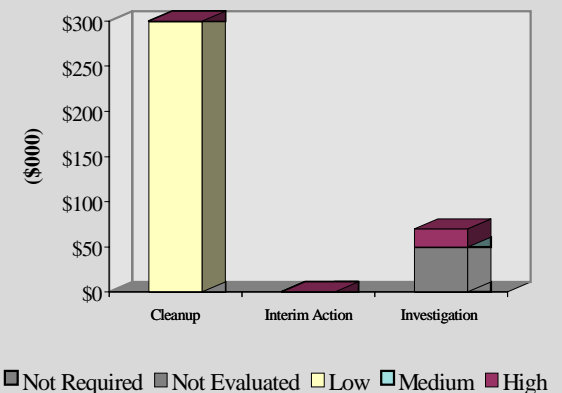
## FY97 Restoration Progress

The installation continued RI/FS activities at Sites 1 and 5 and began RI/FS activities at Sites 2 and 22. An Engineering Evaluation and Cost Analysis (EE/CA) was prepared for the Removal Action at transformer locations at Sites 17, 18, and 20.

## Plan of Action

- Complete RI/FS at Sites 1, 2, 5, and 22
- Initiate Removal Action fieldwork at Sites 17, 18, and 20

## FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 301,000 acres  
**Mission:** Research and develop aircraft  
**HRS Score:** 33.62; placed on NPL in August 1990  
**IAG Status:** Federal Facility Agreement signed in 1990  
**Contaminants:** Waste oils, solvents, VOCs, petroleum hydrocarbons, petroleum/oil/lubricants, rocket fuel, and heavy metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$105.6 million  
**Estimated Cost to Completion (Completion Year):** \$248.5 million (FY2015)  
**Final Remedy in Place or Response Complete Date:** FY2004



## Kern County, California

### Restoration Background

In FY93, an Expanded Source Investigation and a RCRA Facility Assessment identified solid waste management units and the following site types: underground storage tanks (UST), fuel pipelines, landfills, hazardous waste disposal areas, and wastewater and surface water runoff collection areas.

The installation has conducted the following Interim Remedial Actions (IRA): installed a groundwater extraction and treatment system to remove JP-4 jet fuel; removed 330 USTs; removed barrels of hazardous waste from and capped one site; stabilized soil to immobilize dioxin and heavy metals; replaced leaking JP-4 jet fuel pipelines; capped the fire training facility; implemented bioventing at three sites; implemented a groundwater extraction and treatment system to remove volatile organic compounds (VOC); installed a fence at a landfill; and conducted Removal Actions at seven sites.

In FY94, the installation's technical review committee was converted to a restoration advisory board. The installation has entered into two partnership agreements, one with the U.S. Geological Survey to use abandoned groundwater wells to monitor aquifer conditions and the other with Stanford University to develop and demonstrate innovative treatment technologies.

In FY96, using bioventing, the installation cleaned and closed a former UST site ahead of schedule. An innovative bioremediation treatment facility was opened to remediate soil contaminated with petroleum products. IRAs were initiated at Operable Unit (OU) 1 with the construction of two two-phase extraction systems to remediate contamination with petroleum hydrocarbons in the groundwater and soil. At OU2, IRAs were conducted to activate a bioventing system and to begin construction of a two-phase extraction system. In

September, pilot-testing of a dual extraction system began at an area contaminated with tetrachloroethene (PCE).

Also in FY96, decision documents were signed for 40 areas of concern (AOC) at OUs 1 and 2, increasing the number of sites that require no further action to 105. Relative Risk Site Evaluation scores were reevaluated in light of more-accurate data on contaminants and hazards. The installation began five Interim Actions. Several portions of the Federal Facility Agreement (FFA) were renegotiated to take into account funding shortfalls.

### FY97 Restoration Progress

Meetings and conference calls with regulatory agencies cut the review time for several draft documents. Remediation of the aquifer was delayed because of a change in the regulatory attitude.

Twenty-four early actions and 15 site cleanups occurred. Innovative technologies were implemented. The Site Technology Assessment and Remediation (STAR) program, and Base Environmental Analysis Laboratory (BEAL), a laboratory on base, were used to accelerate fieldwork. Soil vapor extraction (SVE) with thermal treatment and bioremediation were also used. All three dual-phase extraction systems constructed in FY96 began operation in FY97.

Site management was improved by placing some equipment on skids for easy removal, combining AOC descriptions at the South Base OU into a summary report, forming an agreement with regulatory agencies for one basewide Record of Decision (ROD) rather than a separate ROD for each OU, and creating a database of applied or relevant and appropriate requirements (ARAR) to help in decision-making.

In continuing partnering efforts, preliminary draft documents were subject to a 10-day internal review, controversial issues were discussed in advance by remedial project managers and regulators,

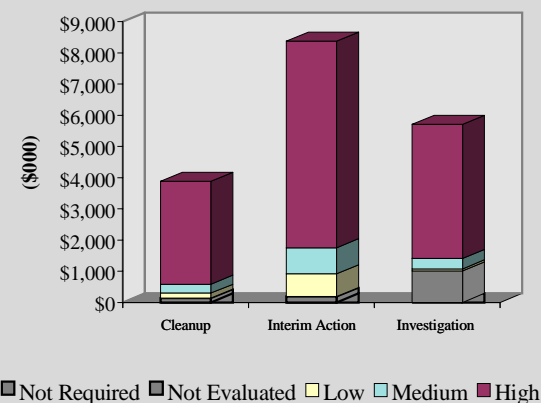
EPA Region 9 and the base met to discuss quality assurance (QA), and FFA requirements concerning Remedial Investigations (RI) were set aside to accelerate the CERCLA process.

A change in the regulatory attitude about the cleanup of the main base (OU1) and some parts of the Phillips Laboratory (OU4) raised concerns among the RPMs that it may not be technologically or economically feasible to remediate the aquifer. Therefore some of the IRAs were put on hold. The Treatability Study of an in situ permeable treatment was not performed because the rate of groundwater migration has been very slow.

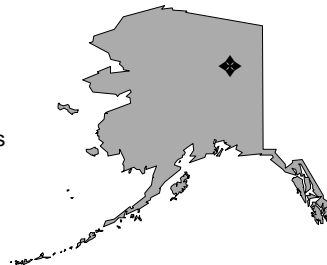
### Plan of Action

- In FY98, continue use of the STAR rig to evaluate AOCs and PRLs, and continue use of the BEAL to provide screening data on field samples
- Use PRL and site reports to replace lengthy OU RIs in FY98
- In FY98, implement pre-ROD Engineering Evaluation and Cost Analysis and IRAs at those sites with highest risk
- In FY98, use SVE and catalytic oxidation to treat of contaminated soil and groundwater extraction with above- ground treatment and carbon filtration for contaminated groundwater
- Partner with EPA Region 9 to implement a multiphase QA program in FY98
- Continue to develop business performance indicators for process improvement in FY98
- In FY98, revise management action plan to reflect new streamlined cleanup strategy

### FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 19,790 acres  
**Mission:** Provide tactical air support to Pacific Air Forces  
**HRS Score:** 48.14; placed on NPL in November 1989  
**IAG Status:** IAG signed in May 1991  
**Contaminants:** Heavy metals, petroleum/oil/lubricants, VOCs, PCBs, and solvents  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$50.7 million  
**Estimated Cost to Completion (Completion Year):** \$5.8 million (FY2011)  
**Final Remedy in Place or Response Complete Date:** FY1999



## Fairbanks, North Star Borough, Alaska

### Restoration Background

Environmental studies at Eielson Air Force Base began in FY82. By FY93, the installation had identified a total of 64 sites. Thirty-one of the 64 sites were grouped into six operable units (OU). Of the remaining sites, 24 were investigated and determined to require no further action.

Site types at the installation include fire training areas, landfills, spill sites, aboveground storage tanks, underground storage tanks (UST), and disposal pits. The most significant contamination has resulted from leaks and spills from piping and storage tanks associated with petroleum/oil/lubricant (POL) distribution systems. The primary contaminants affecting groundwater and soil include POLs, benzene, and chlorinated solvents.

Interim actions completed at the installation in FY90 and FY91 include removal of four USTs and removal and incineration of POL-contaminated soil. Bioventing was implemented at two POL sites, and land treatment is being used to remediate the POL-contaminated soil excavated during Remedial Investigation (RI) activities and Removal Actions. Four POL sites are being treated with free-product removal systems, and bottled water is being provided to residents of two remote areas.

In FY94, Eielson Air Force Base presented a demonstration of the use of air sparging to remove volatile organic compounds (VOC) from contaminated groundwater. A mobile wastewater treatment system also was set up at the facility to treat monitoring-well purge water. This system will greatly reduce the costs associated with disposal of investigation-derived waste.

In FY95, the installation received regulatory approval for use of bioventing and natural attenuation as cleanup alternatives and began Remedial Design (RD) at OUs 1 and 2. The installation also began

fate-and-transport modeling for lead-contaminated sites at OU2. A Remedial Action (RA) contract for landfill capping, bioventing, natural attenuation, soil vapor extraction (SVE), and remediation of lead contamination was initiated at OUs 3, 4, and 5.

In FY95, the installation converted its technical review committee to a restoration advisory board (RAB) to ensure community participation in the restoration process.

In FY96, an RD was conducted for polychlorinated biphenyl (PCB) contamination at Garrison Slough. Bioventing and SVE were initiated at OUs 1 and 2. The installation also completed Removal Actions for lead and POL soil contamination at OU2. A cesspool and a dry well were removed.

### FY97 Restoration Progress

Remedial efforts were completed at all 66 Federal Facility Agreement (FFA) sites except Site SS-067, which contained additional PCB contamination. Approximately 235,000 pounds of PCB-contaminated soil from this site were shipped to a TSCA receiving facility. In addition, land treatment operations continue using a windrow technique implemented in FY96. Cleanup efforts at the Chena River Site are 95 percent complete. All long-term operations (LTO) and long-term monitoring (LTM) activities at active sites continued through FY97. All ROD documents for the base's Installation Restoration Program have been signed.

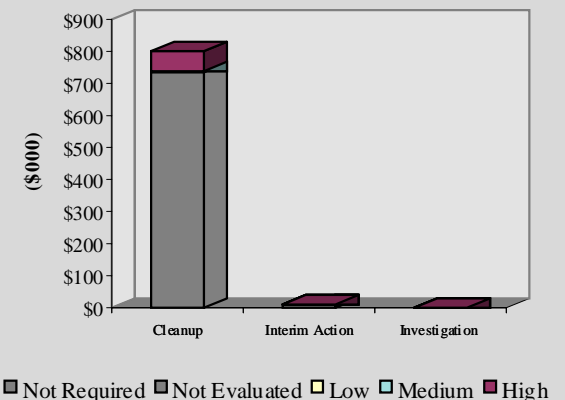
Areas of concern (AOC) were largely addressed in FY97. Limited field investigations (LFI) and response actions were completed at 44 sites where more than 3,000 drums were removed and disposed of and over 218,000 pounds of lead-contaminated sand were removed from a firing range.

Biennial indicator test kit-type monitoring was initiated in the annual sitewide sampling and analysis program, producing an analysis and report cost savings of 80 percent over confirmational laboratory sampling and reporting procedures.

### Plan of Action

- Complete remediation of Site SS-067 in FY98
- Complete LFI and response actions at the remaining 16 AOCs in FY98
- Continue LTO/LTM at active sites in FY98
- Meet land treatment area remediation goals and close the land treatment area in FY98
- Complete a small soil excavation beneath a septic tank at the Chena River Site in FY98
- Reach Construction Complete phase of the program in FY98
- Continue biannual RAB meetings in FY98 and FY99
- Solicit community interest for converting RAB to a community advisory board in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK



<b>Size:</b>	4,812 acres
<b>Mission:</b>	Serve as the primary Marine Corps jet fighter facility on the West Coast; provide materials and support for Marine Corps aviation activities; provide housing for Marine Corps personnel
<b>HRS Score:</b>	40.83; placed on NPL in February 1990
<b>IAG Status:</b>	Federal Facility Agreement signed in October 1990
<b>Contaminants:</b>	Trichloroethene, petroleum hydrocarbons, PCBs, pesticides, herbicides, and other VOCs
<b>Media Affected:</b>	Groundwater and soil
<b>Funding to Date:</b>	\$46.8 million
<b>Estimated Cost to Completion (Completion Year):</b>	\$77.8 million (FY2003)
<b>Final Remedy In Place or Response Complete Date for BRAC Sites:</b>	FY2002



Irvine, California

## Restoration Background

In July 1993, the BRAC Commission recommended that this installation be closed and that its aircraft, personnel, equipment, and support be transferred to Miramar Naval Air Station and Camp Pendleton Marine Corps Base in California. The installation was placed on the National Priorities List (NPL) in 1990.

Environmental studies conducted at the station since FY86 have identified 25 CERCLA sites, more than 450 areas of concern, and more than 400 underground storage tanks (UST) in 18 groups. Site types include landfills, USTs, and spill sites at which solvents and petroleum hydrocarbons were released into soil and groundwater.

In FY89, an Interim Remedial Action (IRA) was initiated to address contaminated groundwater. A treatment system using granular activated carbon technology was installed to remove trichloroethene (TCE) from groundwater. An IRA initiated in FY94 involves installation of drainage controls, slope stabilization, access controls, and limited waste consolidation at two landfills.

The 25 CERCLA sites were grouped into three operable units (OU): volatile organic compound (VOC)-contaminated regional groundwater (OU1), sites believed to be contributing to groundwater contamination (OU2), and all remaining CERCLA sites (OU3). Remedial Investigation and Feasibility Study (RI/FS) activities began in FY90. A Phase I RI/FS was completed in FY93. Phase II activities began in FY94.

The installation investigated 157 solid waste management units and completed a RCRA Facility Assessment in FY93. The installation's UST Tiger Team removed 41 inactive USTs in FY95 and continues to develop scopes of work for Remedial Actions at the remaining UST sites.

The installation formed its BRAC cleanup team (BCT) in FY94. The Environmental Baseline Survey, completed in FY95, indicated that 63 percent of the installation property required no further action.

A technical review committee was formed in FY90 and converted to a restoration advisory board (RAB) in FY94. A RAB Steering Committee has been formed, and the RAB, which has more than 50 members, developed and approved a mission statement.

In FY96, the installation updated its community relations plan and its BRAC Cleanup Plan. The Local Redevelopment Authority (LRA) approved two proposals to convert the installation into a commercial airport, which is addressed in the FY96 draft Reuse Plan. The installation also completed the RI for some OU2 sites. The installation began operating soil vapor extraction (SVE) systems at two UST sites and a free-product recovery system at one UST site.

## FY97 Restoration Progress

Proposed Plans and Records of Decision (ROD) were completed and signed for the first group of OU3 sites. Eleven site cleanups were completed, and three early actions occurred. Coordination of the Removal Action Contract (RAC)/CLEAN improved site management. Reduced Federal Facility Agreement (FFA) review time and fast-track signing of two RODs resulted from cooperative efforts with regulatory agencies. Other goals for FY97 were obviated by resolution of regulatory comments through partnerships with regulators and coordination with Navy policy.

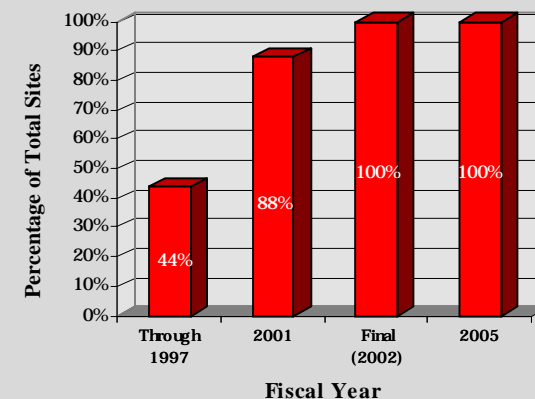
The RAB conducted two public comment meetings in preparation for FY97 ROD signings, as well as educational briefings for the Homeowners Association. The BCT supported numerous RAB meetings, participated in formal public meetings, reviewed FFA

documents, and signed an Interim ROD for one site and a final ROD for 11 no-further-action sites. Regulatory agencies approved 3,209 acres as uncontaminated.

## Plan of Action

- Complete the RI/FS for a part of OU3 in FY98
- Complete the FS and Proposed Plans, and sign RODs for OUs 2A, 2B, and 2C in FY98
- Complete the RI for the remaining sites at OU3 in FY98
- In FY98-FY99, remove operational USTs in close coordination with tenant migration activities
- In FY98-FY99, implement SVE remediation at VOC source area before migration of aircraft operations
- Begin use of Fixed-Price RAC services procurement in FY98-FY99
- Complete the Proposed Plan and sign the ROD for OU1 in FY99

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR





**Size:** 4,858 acres  
**Mission:** Provide long-range bombardment missiles and air refueling support  
**HRS Score:** 33.62; placed on NPL in August 1990  
**IAG Status:** Federal Facility Agreement signed in January 1992  
**Contaminants:** Solvents, petroleum/oil/lubricants, lead, and low-level radioactive waste  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$51.5 million  
**Estimated Cost to Completion (Completion Year):** \$47.1 million (FY2001)  
**Final Remedy in Place or Response Complete Date:** FY2001



## Rapid City, South Dakota

### Restoration Background

Environmental studies conducted from FY85 to FY87 identified 20 sites at Ellsworth Air Force Base. Site types include landfills, underground storage tanks (UST), maintenance areas, a fire training area, and a low-level radioactive waste burial site. Groundwater and soil contamination resulted from releases of trichloroethene (TCE) and petroleum/oil/lubricants (POL) at these sites.

Sites at the installation were classified in 12 operable units (OU), which were then placed in four groups. Group 1 contains OUs 1, 2, and 4; Group 2, OUs 9, 10, and 12; Group 3, OUs 3, 5, 7, and 8; and Group 4, OU 11. OU6, which entered the CERCLA process first, was not placed in a group.

In FY91, the installation removed 72 USTs and constructed a pilot-scale groundwater treatment plant for TCE and POL contamination. In FY93, 160 UST sites were evaluated and 31 USTs were removed, including 5 USTs removed from the low-level radioactive waste burial site. The installation designed an accelerated cleanup program to reduce project cost and accelerate cleanup. Field-screening techniques were used to eliminate 1 year of Remedial Investigation and Feasibility Study (RI/FS) activities. Negotiations with EPA and the state regulatory agency decreased the time needed to review primary documents from 60 to 45 days, established standard formats, and provided for concurrent review.

In FY94, a restoration advisory board (RAB) was formed. The RAB continues to meet quarterly. The installation also formed partnerships with regulatory agencies to expedite document review and to facilitate compliance with regulations through preventive measures. Remedial Design activities were initiated for OUs 1, 2, 4, and 9 through 12. At OUs 1, 2, and 4, the installation began a pilot-scale study of a soil vapor extraction (SVE)/groundwater extraction and treatment system.

An Interim Action extended the installation's water supply line to three private homes near the southwest part of the base. An additional 100 USTs were removed.

In FY95, the installation completed the final FS for OUs 1, 2, 4, 9, 10, and 12 and began Interim Remedial Actions, which included groundwater extraction and treatment and SVE. A two-phase vacuum extraction test was conducted at OUs 1, 2, and 4. The drinking water program was extended to 12 additional nearby residences. A final 12 USTs and 4,000 cubic yards of contaminated soil were removed, thus completing the UST investigation and removal program.

During FY96, a final FS Report and a Proposed Plan for OUs 3, 5, 7, and 8 were completed along with the RI/FS Report and the Proposed Plan for OU11. Remedial Action (RA) activities were started for OUs 1 through 5, 7 through 10, and 12. Construction of a groundwater extraction and treatment system began for OU11, and RA construction was completed at OU 6. Interim Records of Decision (ROD) were signed for OUs 1 and 4, and final RODs were signed for OUs 1 through 10 and OU12. Nine of the final RODs required RAs (OUs 1 through 8 and OU12); two proposed no further action (OU9 and OU10). The RAB held public meetings to review all 11 of the final RODs.

### FY97 Restoration Progress

The ROD for OU11 was signed, and the RA was started. RAs were completed for OUs 1 through 5, 8, and 12, and long-term monitoring (LTM) and operation and maintenance started. For four of the sites, the remedy was a landfill cover. LTM at OUs 6 and 7 continued.

The installation made an effort to keep EPA Region 8 and the South Dakota Department of Environment and Natural Resources well informed about, and involved in, installation cleanup activities.

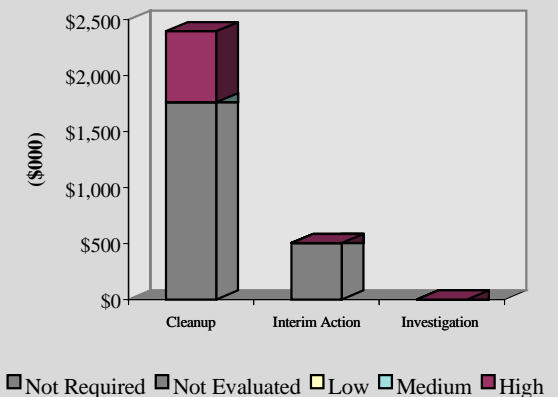
Monthly construction meetings involving installation personnel, regulatory agencies, contractors, and the U.S. Army Corps of Engineers allowed integrated project coordination and execution.

The removal of unexploded ordnance from Site OT-18 delayed initiation of the PA/SI for that site.

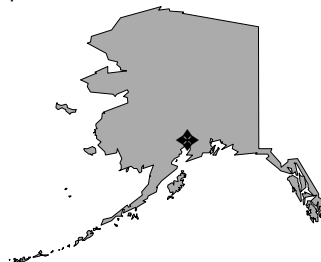
### Plan of Action

- Begin the Preliminary Assessment and Site Inspection (PA/SI) for Site OT-18 upon clearance of unexploded ordnance from the site in FY98
- Continue LTM of operations at all OUs
- Complete a PA/SI for a new area of concern (AOC-24) in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK



<b>Size:</b>	13,103 acres
<b>Mission:</b>	Headquarters Alaskan Command, 11th Air Force and host unit, 3rd Wing; also hosts Alaskan NORAD Region, Rescue Coordination Center, and 632nd Air Mobility Support Squadron
<b>HRS Score:</b>	45.91; placed on NPL in August 1990
<b>IAG Status:</b>	Federal Facility Agreement signed in 1991
<b>Contaminants:</b>	VOCs, heavy metals, petroleum/oil/lubricants, solvents, and paints
<b>Media Affected:</b>	Groundwater, surface water, sediment, and soil
<b>Funding to Date:</b>	\$59.5 million
<b>Estimated Cost to Completion (Completion Year):</b>	\$21.4 million (FY2026)
<b>Final Remedy in Place or Response Complete Date:</b>	FY2000



## Anchorage, Alaska

### Restoration Background

Environmental studies completed between FY83 and FY97 identified 81 sites at this installation, which are grouped into six operable units (OU). Sites include old construction landfills, petroleum spill sites, and underground storage tanks (UST). Thirty-seven sites are covered under the Federal Facility Agreement (FFA), and 39 sites are covered under the State-Elmendorf Environmental Restoration Agreement (SERA) with the state of Alaska. The SERA agreement addresses solid waste, USTs, and petroleum/oil/lubricant spills covered under 18 AAC 75.

In FY92, asphalt recovery was completed at SS10 in OU4. In FY93, the installation completed construction of a long-term groundwater treatment system at OU2. The system extracts free petroleum product from the groundwater and treats the groundwater by air stripping. This Interim Remedial Action was performed at a site containing four 1-million-gallon USTs.

The installation removed polychlorinated biphenyl (PCB)-contaminated sediment from a stormwater ditch at OU3 in FY94. Because the ditch is adjacent to an elementary school in a residential area, an expedited response action was initiated to remove the polychlorinated biphenyl (PCB).

In FY94, bioventing Treatability Studies were completed at three sites. The results indicated that bioventing was beneficial in the remediation of petroleum-contaminated soil at the installation. An intrinsic remedial Treatability Study also was completed for OU4, and a Record of Decision (ROD) was signed for OU1.

In FY95, the installation continued Remedial Investigation and Feasibility Study (RI/FS) work at OU6 and completed RODs for OU2, OU4, and OU5. Remedial Designs (RD) were completed to close the four 1-million-gallon USTs at OU2, clean up PCBs at OU3, install

bioventing systems at OU4, and construct an engineered wetland at OU5. Removal Actions were conducted at a pesticide storage facility in OU7 and an asphalt seep area at OU1. The installation also installed, and began operating, bioventing systems at eight UST sites and initiated long-term monitoring (LTM) of groundwater.

In FY96, the installation prepared RDs for OU6. RDs included beach sweeps at LF04, a two-phase high vacuum extraction (HVE) system at SD15, and debris removal and partial covering at LF02. In addition, the installation closed the four 1-million-gallon USTs and removed associated pipeline at OU2, conducted a PCB Treatability Study for OU3, installed the bioventing systems at OU4, and began construction of the engineered wetland at OU5.

The Office of Public Affairs (OPA) coordinates the installation's public involvement program. OPA serves as the focal point for all communication between the public and the installation about the environmental restoration program, provides information about activities, and responds to community inquiries and concerns. In FY95, the installation formed a restoration advisory board (RAB). In FY96, the board met quarterly and toured remediation areas.

### FY97 Restoration Progress

RODs were signed for OUs 3 and 6. RDs were completed for remediation of PCBs at OU3 and for removal of the North Jet Pipeline. The installation initiated beach sweeps at LF04 in OU6 and Treatability Studies for a two-phase HVE system at SD15 in OU6 and began limited field investigations at nine areas of concern (AOC). In addition, long-term operations (LTO) continued for the completed engineered wetland at OU5 and for 22 bioventing systems at 10 sites.

Basewide LTM of groundwater and surface water continued, one bioventing system closed, and 13,800 feet of pipeline at ST32 was removed. The installation recovered 0.40 gallons of free product,

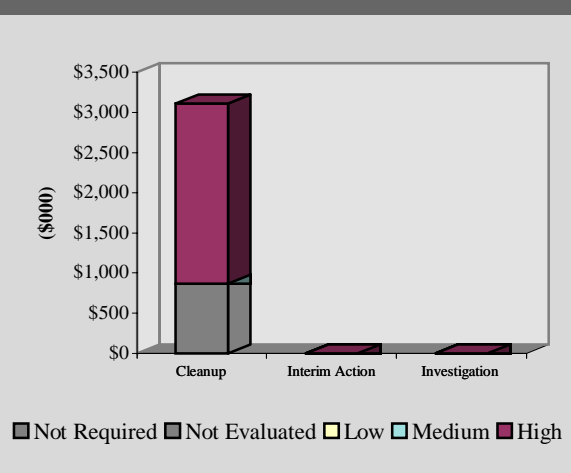
treated 36,000 gallons of water, completed closure of the four 1-million-gallon USTs, and removed associated pipeline at OU2.

In FY97, the RAB charter was rewritten to focus on all environmental activities, not just restoration. This began the transition to a community advisory board. The Board toured installation environmental activity areas. Furthermore, in FY97, Elmendorf's RAB received the Pentagon Crystal Award.

### Plan of Action

- Complete PCB removal at OU3 and limited field investigations at nine AOCs in FY98
- Complete removal of 11,000 feet of North Jet Pipeline in FY98
- Continue recovery of free product at OU2 in FY98
- Continue LTO of OU5 engineered wetland system, a two-phased HVE system at SD15 in OU6, and 22 bioventing systems at 10 sites in FY98
- Continue beach sweeps at LF04 in OU6 in FY98
- Continue LTM of basewide groundwater and surface water in FY98
- Conduct 5-year ROD reviews and Remedial Action Completion Reports for OU1 through OU6 in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 2,282 acres  
**Mission:** Used as a tactical fighter wing  
**HRS Score:** NA  
**IAG Status:** None  
**Contaminants:** Industrial waste, spent solvents, fuels, waste oil, paints, pesticides, alkali, low-level radioactive waste, chlorine gas, PCBs, TCE, and medical waste  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$26.5 million  
**Estimated Cost to Completion (Completion Year):** \$3.9 (FY2028)  
**Final Remedy in Place or Response Complete Date for BRAC Sites:** FY1998



*Alexandria, Louisiana*

## Restoration Background

In July 1991, the BRAC Commission recommended closure of England Air Force Base. The installation closed in December 1991.

Since FY82, environmental studies have identified 42 sites at the installation, including landfills, underground storage tanks, aboveground storage tanks, fire training areas, oil-water separators, a sewage treatment pond, a low-level radiation site, and gas training kit burial sites. Petroleum by-products, pesticides, and herbicides are the primary contaminants affecting the soil.

In FY92, a RCRA Facility Assessment identified 59 solid waste management units (SWMU) and 5 areas of concern. In FY93, a BRAC cleanup team (BCT) was formed.

In FY94, the installation completed the Phase I RCRA Facility Investigation (RFI) and the Environmental Baseline Survey (EBS). Regulatory concurrence was received for approximately 1,200 acres designated as CERFA-clean. In addition, the installation established a restoration advisory board (RAB). The RAB was briefed on the status of all restoration activities and on the Relative Risk Site Evaluation process. Measures taken to improve site management included fostering BCT involvement by meeting at the offices of team members. The BCT has made efforts to improve the decision-making process by developing Consensus Statements to resolve issues. The installation updated its BRAC Cleanup Plan and completed a basewide lease in early FY95.

In FY95, the installation completed comprehensive field investigations to establish background soil concentration levels, began field activities for a Phase II EBS site investigation, completed a lead-based-paint survey of houses and schools, and completed an aboveground storage tank cleaning project. The installation began

Interim Actions at several sites, including a fire training pit, a polychlorinated biphenyl (PCB) spill site, a solvent spill site, and a civil engineering drainage ditch. The installation completed closure of an aircraft refueling and hydrant system and completed cleanup of chlorine gas and the medical waste incinerator.

In FY96, quarterly RAB meetings continued. The installation replaced the fire station oil-water separator and completed cleanup activities at the civil engineering drainage ditch, low-level radiation site, hospital PCB site, and jet engine shop. Delineation of a trichloroethene (TCE) groundwater plume was completed. The final Comprehensive Background Survey (CBS) was submitted to EPA and the Louisiana Department of Environmental Quality (LDEQ).

The installation transferred 167.5 acres of CERFA Category 1 through 4 property to new owners and completed a finding of suitability to transfer (FOST) for an additional 991 acres. In addition, negotiations with regulatory agencies began for the Phase II RFI.

## FY97 Restoration Progress

The work initiated in FY96 on a Human Health Risk Assessment and an Ecological Risk Assessment Consensus Statement continued in FY97. In addition, a corrective measures study for RFI sites was completed in FY97. The installation completed the Interim Action at the Fire Training Site and three other contaminated-soil sites. SWMU 41 was closed and capped. The process of obtaining EPA and LDEQ concurrence on the final CBS report also began.

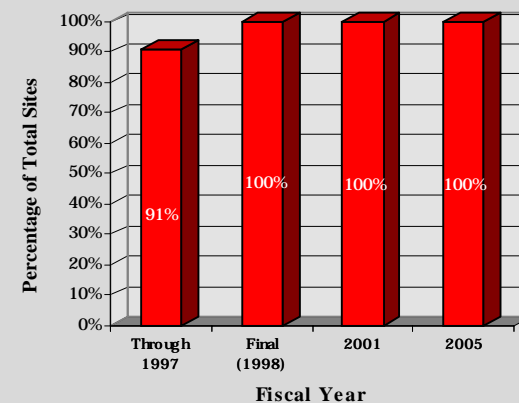
The BCT conducted monthly meetings, and the LDEQ and EPA Region 6 each presented briefings.

Some activities scheduled for completion in FY97 were delayed because of a need for further studies.

## Plan of Action

- Characterize TCE plume in FY99
- Obtain EPA and LDEQ concurrence on the final CBS report in FY98
- Obtain EPA and LDEQ concurrence on Human Health Risk Assessment and Ecological Risk Assessment Consensus Statements in FY98
- Complete Site Inspections at restoration sites in FY98
- Begin the removal and incineration of contaminated soil from the Chemical Burial Mound in FY98

## SITES ACHIEVING RIP OR RC PER FISCAL YEAR



**Size:** 5,869 acres  
**Mission:** Provide intercontinental ballistic missile and aerospace rescue operations  
**HRS Score:** 39.23; placed on NPL in February 1990  
**IAG Status:** Federal Facility Agreement signed in September 1991  
**Contaminants:** Oil, solvents, metals, acids, petroleum, and explosives residues  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$52.0 million  
**Estimated Cost to Completion (Completion Year):** \$61.9 million (FY2009)  
**Final Remedy in Place or Response Complete Date:** FY2009



## Cheyenne, Wyoming

### Restoration Background

The Air Force began restoration activities at F.E. Warren Air Force Base in FY84, when solvent-contaminated soil was removed from an area near a helicopter maintenance facility. In FY85, a basewide Preliminary Assessment and Site Inspection identified 25 potentially contaminated sites, including underground storage tanks, spill sites, fire training areas, landfills, small-arms firing ranges, and explosive ordnance disposal areas. Remedial Investigation and Feasibility Study (RI/FS) activities began at those sites in FY87. The RI Report confirmed the presence of contaminants at 20 sites, which subsequently were grouped into 10 operable units (OU), and identified 5 plumes of trichloroethene (TCE)-contaminated groundwater.

In FY90, the entire base was placed on the National Priorities List (NPL) because of the TCE-contaminated groundwater. Approximately 2,500 private wells, used primarily for irrigation and watering of livestock, are located within 3 miles of the installation. To accelerate cleanup, the installation has implemented generic remedies, such as air stripping of contaminated groundwater, capping of landfills, and removal of contamination sources at spill sites.

In FY92, the installation signed a Record of Decision (ROD) for OU4. In FY94, the installation submitted RI Reports for OUs 1 and 3 and a ROD specifying no further action (NFA) for OU5.

In FY94, a packed-tower air stripper was installed as part of a Treatability Study for TCE-contaminated groundwater at Spill Site 7. To minimize the risks associated with a contaminated groundwater plume potentially generated by Landfill No. 3, the installation began delivering bottled water to more than 20 families in the Nob Hill subdivision next to the base. The installation also began bioventing of petroleum hydrocarbon-contaminated soil at OU10.

In FY95, the installation removed and disposed of an oil-water separator and associated soil contaminated with TCE and began construction of a landfill cap. A leachate collection system and a groundwater extraction and treatment system also began operating. The installation began implementing a 1-year Treatability Study for a packed-tower air stripper at a spill site. The installation also was selected to test a two-phase vapor extraction system.

In FY95, the installation signed a ROD specifying NFA for soil contamination at OU1. The installation also submitted a Proposed Plan to provide a municipal water line to the residents of Nob Hill, who were receiving bottled water. In addition, a restoration advisory board was formed.

In FY96, 11 sites were evaluated through the Relative Risk Site Evaluation process. Eight sites ranked high, two ranked medium, and one was determined to need NFA. A design was completed for a Time-Critical Removal Action at Landfill 2C, and presumptive remedies, including air stripping, were implemented at OU2.

### FY97 Restoration Progress

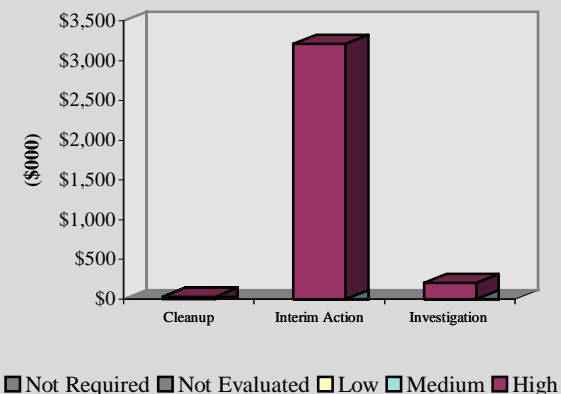
At Landfill 6, construction of an evapotranspiration (ET) cover began as part of a Proposed Plan and ROD for an interim corrective action. The installation completed construction of the water line to provide drinking water to residents of Nob Hill and resubmitted the RI/FS to the regulatory agencies. Bioventing at OU10 continued after reevaluation. In addition, RODs were signed for the installation of a RCRA D cap as an interim corrective action at Landfill 5A and a passive treatment wall (iron filing wall) for treating contaminated groundwater at Spill Site 7.

Also in FY97, the installation conducted a bottom-up review and redirected the entire environmental program in light of funding constraints. Projects were reprioritized, and the Federal Facility Agreement was revised and rescheduled. In addition, early action field investigation work plans were implemented to expedite landfill characterization.

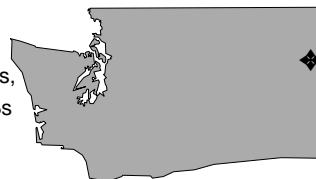
### Plan of Action

- In FY98, amend ROD for Landfill 5A to use soil cover as selected remedy; begin cover construction
- Design an iron filing wall at Spill Site 7 to remediate TCE in groundwater in FY98
- Complete Removal Action at Landfill 2C in FY98
- Complete a strategic site cleanup plan based on stabilized funding in FY98
- Continue to use innovative technologies to expedite cleanup in a cost-effective manner

### FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 4,300 acres  
**Mission:** Provide aerial refueling and airlift services  
**HRS Score:** 31.98; placed on NPL in March 1989  
**IAG Status:** IAG signed in 1990  
**Contaminants:** Solvents, fuels, electroplating chemicals, cleaning solutions, corrosives, photographic chemicals, paints, thinners, pesticide residues, and PCBs  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$32.7 million  
**Estimated Cost to Completion (Completion Year):** \$43.7 million (FY2026)  
**Final Remedy in Place or Response Complete Date:** FY2003



### Spokane County, Washington

## Restoration Background

Environmental studies since FY85 have identified 37 sites at the installation, including contaminated fire training areas, landfills, radioactive waste sites, spill sites, waste pits, disposal pits, and ditches.

In FY92, Interim Actions undertaken at the installation included implementation of an extraction and treatment system for groundwater contaminated with trichloroethene (TCE) and removal of 1,600 cubic yards of soil contaminated with fuels and oils.

By FY93, the installation had identified 30 sites and completed Remedial Investigation and Feasibility Study (RI/FS) activities at 8 sites. The Air Force signed two Records of Decision (ROD). Two sites required no further action, two required long-term monitoring (LTM) or institutional controls, and four required cleanup.

In FY94, the installation completed Remedial Designs (RD) for two sites, began RD activities at a third site, and started construction on a Remedial Action (RA) at a base landfill. The installation was an active participant in the bioventing technology and intrinsic remediation initiatives of the Air Force Center for Environmental Excellence. The intrinsic remediation study evaluated the decomposition of benzene and its breakdown products. The installation also participated in an in-well air stripping experiment.

In FY95, the installation formed a Restoration Advisory Board (RAB). The installation also completed construction of a landfill cap and expansion of the existing extraction and treatment system to contain a TCE-contaminated groundwater plume at a base landfill. The construction of a new groundwater extraction and treatment system to contain a TCE-contaminated plume at a wastewater lagoon site also began in FY95. Innovative technologies employed at the installation

include low-flow well purging techniques and direct push technology for site characterization of soil to reduce investigation-derived waste. The installation began a Preliminary Assessment and Site Inspection (PA/SI) for nine areas of concern (AOC) and the two remaining original sites. Drinking water was provided to members of the local community to replace drinking water contaminated by TCE leaching from a landfill.

The installation completed an RI/FS for 20 sites in FY96, and the Air Force signed a ROD for the sites. Currently, 13 sites require no further action, 1 requires institutional controls, 5 require LTM, and 1 requires long-term operations (LTO). The installation completed construction of the wastewater lagoon treatment plant and placed the plant in operation. RA construction began at a former fire training area, a TCE-contaminated ditch, and a spill area at the Bulk Fuel Storage Site. Because of contamination identified during the PA/SI, seven AOCs were transferred to the Installation Restoration Program, thereby increasing the number of sites at the installation to 37.

## FY97 Restoration Progress

Groundwater air sparging and soil bioventing systems at the former fire training area were implemented. In addition, construction and/or Interim Removal Actions were initiated at the following sites: wastewater lagoons, a petroleum/oil/lubricant (POL) bulk storage area, a waste storage area, waste fuel operations, a fuel transfer facility, arsenic ditches and culverts, and TCE orphan plumes. LTO and LTM continue for basewide groundwater.

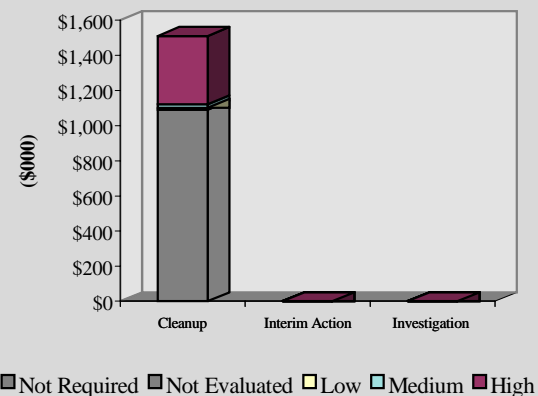
Cooperation with EPA and the state and good communication and understanding of goals helped expedite document review, resolve issues, and foster partnering. The Final PHA report has been released, validating the past and current base clean-up program.

RAB input to the Agency for Toxic Substances and Disease Registry's Public Health Assessment was critical in FY97. The final PHA report has been released, validating the past and current base cleanup program. The RAB also assisted with Relative Risk Site Evaluations, as well as document review, construction schedules, and project prioritization.

## Plan of Action

- Initiate delisting with EPA and state in FY98
- Sign ROD for nine sites and two AOCs in FY98
- Continue construction and/or Interim Removal Actions at the wastewater lagoons, petroleum/oil/lubricant bulk storage area, waste storage area, waste fuel operations, fuel transfer facility, and arsenic ditches and culverts in FY98
- Continue LTM and operation and maintenance for groundwater treatment plants in FY98
- Implement natural attenuation with 3-year review at TCE orphan plumes in FY98
- Continue LTM and operation and maintenance at both bioventing and groundwater air sparging sites in FY98
- Continue basewide and off-base residential well sampling program in FY98

## FY98 FUNDING BY PHASE AND RELATIVE RISK





**Size:** 12 acres of former 16,000-acre government plant  
**Mission:** Manufacture smokeless powder (private party operated a batch chemical plant)  
**HRS Score:** 36.3; placed on NPL in September 1983  
**IAG Status:** None  
**Contaminants:** Dioxin, organic and inorganic chemicals, and metals  
**Media Affected:** Groundwater and soil  
**Funding to Date:** \$0.6 million  
**Estimated Cost to Completion (Completion Year):** \$0.6 million (NA)  
**Final Remedy in Place or Response Complete Date:** NA



## Nitro, West Virginia

### Restoration Background

Environmental restoration sites at Fike-Artel Chemical have been grouped into five operable units (OU): disposal of storage tank and drum contents (OU1); decontamination and disposal of storage tanks, surface drums, and aboveground structures (OU2); removal of buried drums (OU3); Remedial Investigation and Feasibility Study (RI/FS) of groundwater and soil (OU4); and RI of the cooperative sewage treatment plant (OU5). Private-sector potentially responsible parties (PRP) and EPA are leading all environmental restoration activities.

In FY93, an RI was completed for OU1. In FY94, RI activities began for OU2. Twenty PRPs signed an agreement with EPA to remove 7,000 to 16,000 buried containers from OU3.

In FY95, an Interim Action was conducted to remove underground storage tanks (UST) and aboveground storage containers (OUs 1, 2, and 3). RI activities for OU2 were completed, RI/FS activities began for OU4, and RI activities were undertaken for OU5.

In FY96, USTs and building OUs were demolished and removed. Final allocation of liability was reached and a principal agreement was signed. The Consent Decree for OU4 was lodged in court and protested by a nonsigning party. The RI work plan was submitted to EPA for approval. EPA and the PRPs were negotiating a Consent Decree.

### FY97 Restoration Progress

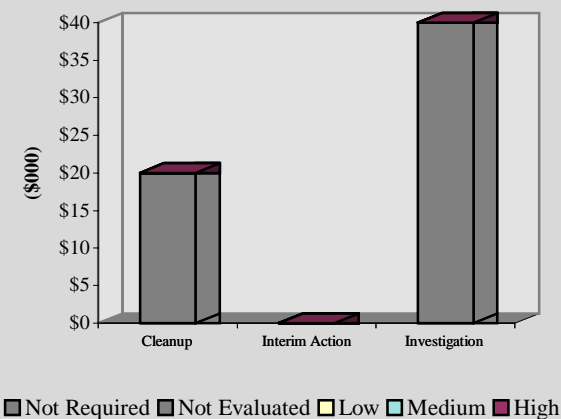
During the fiscal year, the PRPs (private and government) continued to improve site management techniques and partnering efforts by revising the RI/FS work plan for OU4. The RI/FS work plan has been submitted to EPA for review and concurrence. The U.S. Army Corps of Engineers also completed a UST Removal Action for OU5.

Some activities scheduled for completion in FY97 were delayed while the revised OU4 RI/FS work plan awaits EPA concurrence.

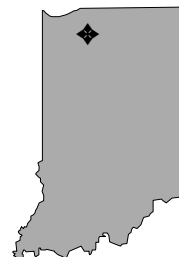
### Plan of Action

- In FY98, begin the RI/FS for OU4 and OU5, including Relative Risk Evaluation upon EPA approval of the work plan

### FY98 FUNDING BY PHASE AND RELATIVE RISK



**Size:** 443 acres of 13,400-acre former ordnance plant  
**Mission:** Manufactured ordnance (private use involved solvent recycling and chemical manufacturing)  
**HRS Score:** 52.05; placed on NPL in September 1983  
**IAG Status:** None  
**Contaminants:** VOCs, solvents, PCBs, PAHs, and inorganic compounds  
**Media Affected:** Groundwater, surface water, sediment, and soil  
**Funding to Date:** \$5.6 million  
**Estimated Cost to Completion (Completion Year):** \$40.6 million (FY2020)  
**Final Remedy In Place or Response Complete Date:** FY2020



*La Porte, Indiana*

### Restoration Background

Environmental studies conducted at Fisher-Calo in FY82 identified 11 areas of contamination, including 8 areas of soil contamination and 3 groundwater contaminant plumes. Surface soil is contaminated with solvents, inorganic compounds, and polychlorinated biphenyls (PCB). Groundwater is contaminated with volatile organic compounds (VOC). Surface water samples indicate the presence of inorganic compounds, and sediment samples contain PCBs.

A Remedial Investigation (RI) was completed in FY89, and a Feasibility Study (FS) was completed in FY90. A Record of Decision was submitted in late FY90. A Consent Decree, entered into by EPA and the potentially responsible parties (PRP), requires the PRPs to conduct Remedial Design and Remedial Action (RD/RA) activities. In FY93, the RD work plan was completed and approved by the regulatory agencies. RD activities in FY94 included design of a groundwater extraction and treatment system and a soil flushing or soil vapor extraction (SVE) system. By FY97, the U.S. Army Corps of Engineers had conducted relative risk evaluation at all sites.

In FY95, RD activities included operation of the SVE system and enhanced vapor extraction pilot treatment facilities. Interim Remedial Actions included removal and disposal of about 3,000 buried containers.

During FY96, continuing RD/RA efforts included excavating and incinerating soil containing semivolatile organic compounds and PCBs, completing design of soil flushing or SVE for soil contaminated with VOCs, and completing design of groundwater extraction and treatment systems. These actions are being completed by the PRP site group, which also has continued to pursue litigation on issues related to the extent of DoD's liability.

### FY97 Restoration Progress

Litigation for resolving issues related to allocation of liability is awaiting scheduling by the District Court. Construction of the groundwater treatment system was initiated, and the private PRPs continued to operate existing source area systems and began the design of others. Source area design is under EPA review. The Area 3 air sparging system is being operated.

### Plan of Action

- Respond to litigation schedule as necessary in FY98

### FY98 FUNDING BY PHASE AND RELATIVE RISK

